

I: CROPS GROWN IN STRUCTURES OR CONTAINERS (PREVIOUSLY KNOWN AS GREENHOUSE CROPS) (310 CLAUSE 7.5)

CANADIAN ORGANIC STANDARDS*

7.5 Crops grown in structures or containers (previously known as greenhouse crops)

7.5 “Clause 7.5 applies to:

- all organic crops grown in containers (indoors or outdoors). Containers include production systems that limit root contact with native soil, such as crops grown in pots, troughs and plastic-lined beds, etc.;
- in-ground crops that are grown using supplemental lighting, heating or CO₂ enrichment within a structure, such as a greenhouse, tunnel (high or low), hoophouse, etc.”

“This clause does not apply to:

- Sprouts, Shoots or Microgreens (Clause 7.4);
- in-ground crops grown in a structure, such as a cold frame, caterpillar tunnel, etc., without supplemental lighting, heating or CO₂ enrichment;
- crops grown under row cover, insect netting or bird netting (covered in Clause 5).”

“ All relevant subclauses in this standard apply to crops grown in structures or containers where this subclause has no specific requirements, including 5.1.3, 5.1.4, 5.1.5, 5.1.6, and 5.1.7.”

7.5.1 “In a permanent, in-ground soil system, prohibited substances shall not have been used for at least 36 months before the harvest of an organic crop.”

COG'S GUIDE TO THE STANDARDS

7.5 The name of the clause was changed to clarify the types of operations that are or are not subject to the requirements of 7.5.

Clause 7.5 applies to the following:

- 1) All crops grown in containers, including pots, troughs and plastic-lined beds and any other system that limits root contact with the soil in the ground. This includes crops in pots within cold frames, tunnels and unheated greenhouses, as well as pots placed in the ground outside.
- 2) Crops grown with the use of artificial lighting, supplemental heating or CO₂ enrichment within a structure. The protective structure could be anything from a high-tech greenhouse to a simple cold frame; the key is that this section only applies if there is artificial lighting, supplemental heating or CO₂ enrichment.

These systems are subject to the requirements of 7.5 and Clause 5 (except that 7.5.9 allow for an exemption from the crop rotation requirement in 5.4.1 a.

Parallel production of annual crops is prohibited except for a few situations as outlined in 5.1.4. Maintenance of a split operation (5.1.3) cannot be permanent: complete transition to organic is eventually required.

The organic portion of the greenhouse must be identifiable (5.1.6) and cannot be switched back and forth from organic to non-organic production (5.1.7).

In addition, Clause 8 (Integrity) pertains to greenhouse production systems. Clause 9 is pertinent if further processing is done.

7.5.1 In-ground operations have crops rooted in the ground rather than in containers or pots. The soil and structures in these operations need to be free of the substances prohibited by 1.4 and 1.5 for at least 36 months before an organic crop can be harvested (and there must be documentation to support this). Note that if the in-ground

*Organic production systems: general principles and management standards. CAN/CGSB-32.310-2020. Canadian General Standards Board. 1
Dec. 2020. www.publications.gc.ca/site/eng/9.854643/publication.html.

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7.5.2 “Hydroponic and aeroponic productions are prohibited.”

7.5.2.1 “The soil used in a container system shall:

- a) not contain prohibited substances (CAN/CGSB-32.310: 1.5);
- b) be composed of substances listed in Table 4.2 (Column 1) of CAN/CGSB-32.311;
- c) contain a mineral fraction (sand, silt or clay, excluding perlite and vermiculite) and biological fraction, which contribute to the physical soil structure;
- d) be composed of at least 10% by volume of compost (exception: seedling/starter mixes may contain less than 10% compost if needed to ensure adequate germination/rooting); and
- e) contain at least 2% by dry weight or volume (whichever unit of measure is appropriate) of minerals (sand, silt or clay, excluding perlite and vermiculite) at the start of a production cycle.”

operations have no artificial lighting, heating or CO₂ enrichment, this section of the standard does not apply. Instead, operators should just follow the requirements of Clause 5.

Greenhouse operators can move soil from other parts of the operation into the greenhouse as long as the soil has been free of prohibited substances for at least 36 months. When importing soil from off the farm, documents are needed to show the imported soil has been free of prohibited substances for at least 36 months.

Soil mixes used in container systems cannot contain any substances prohibited by 1.4 or 1.5 (e.g., products of GE, products of nanotechnology, irradiated substances, sewage sludge or substances not listed in the PSL).

7.5.2 The standard will not certify the following as organic:
-hydroponics – the cultivation of plants in aqueous nutrient solutions without the aid of soil; or
- aeroponics – plants suspended with their roots exposed to the air.

7.5.2.1 Soil is defined in 3 as a “mixture of minerals, organic matter and living organisms.” This means soil mixes (aka growth media, culture medium, soil-less mixes, potting mixes, etc.) used in containerized organic production must:
-contain some clay, sand or silt;
-contain organic matter;
-be alive; and
-provide the bulk of the nutrients to the plant throughout the crop cycle.

For example, perlite or rockwool do not meet this requirement because they do not contain organic matter or provide the nutrients needed to support a crop without fertilizers. They are also missing the necessary mineral fraction even though perlite and rockwool are heated forms of mineral compounds. The Standard limits the mineral fraction to sand, silt or clay. As another example, a mix of peat moss, coir and compost doesn't meet the requirement because it is missing the mineral fraction.

Soil, as defined in the standard, is not required for organic plant propagation or for transplant production.

*Organic production systems: general principles and management standards. CAN/CGSB-32.310-2020. Canadian General Standards Board. Dec. 2020. www.publications.gc.ca/site/eng/9.854643/publication.html. 2

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CANADIAN ORGANIC STANDARDS*

7.5.2.2 “The starting and maintained volume of soil in containers shall be proportional to the overall plant size, growth rate, targeted yield, and length of crop cycle.

a) For crops grown in structures covered by Clause 7.5, the photosynthetic area comprises the floor area devoted to crop production including the aisles and spaces between plants but not including non-production areas, such as centre or header aisles, service ways, and storage areas, etc.

b) For outdoor crops grown in containers, the photosynthetic area comprises the ground area devoted to crop production including the walkways, aisles and spaces between plants, but not including non-production areas, such as field access ways, turn-around areas, hedgerows and storage areas, etc.

c) The length of a crop cycle will vary across the country, particularly in unheated structures, and should be taken into consideration when determining the volume of soil required. For perennial crops, the length of the active crop cycle starts at the beginning of seasonal growth and ends at the end of harvest during the same season.”

“NOTE: For container crops that are difficult to top-dress, for example strawberries, sufficient nutrition should be provided in the soil, prior to the start of the crop, to provide available nutrition continuously for the duration of the crop cycle. When this is not possible, liquid amendments listed in Table 4.2 (Column 1) of CAN/CGSB-32.311 may be used.

7.5.2.3 The minimum amount of soil required for crops not covered by 7.5.2.4 is 2.5 L of soil per m² of photosynthetic area per week of crop production time. The maximum amount of soil required in any case is 60L/m² of photosynthetic area. Crop production time is counted from the start of plant propagation (for

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7.5.2.2 The growing area, calculated in either square metres or feet, is the overall area available for photosynthesis. This includes both plant rows and aisles, but not greenhouse service alleys (perpendicular to the rows), header houses, staff rooms, offices, propagation houses or storage areas. If part of the greenhouse is not occupied by crop production but has the potential for crop production, it can be excluded from the calculation for the current crop.

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CANADIAN ORGANIC STANDARDS*

example seeding, sticking of unrooted vegetative cuttings, divisions, etc.) until final harvest.”

7.5.2.4 “The following conditions apply to containerized, semi-indeterminate and indeterminate staked crops (for example, tomatoes, peppers, cucumbers, eggplant):

a) additional compost applications shall be included in the fertility program;

b) the maintained soil volume shall be at least 60 L/m² (1.2 gal./ft²), based on the photosynthetic area. Interplanting short-lived crops among other crops (e.g., basil among tomatoes) or having multiple crop cycles within a year (i.e., cucumber) do not reduce this 60 L/m² requirement;

c) production units existing prior to November 2016 that have been continuously managed organically by the same operator, have not had major renovations, have not changed production area and do not comply with 7.5.2.4.b) are allowed to continue producing staked crops using a soil volume smaller than 60 L/m² (1.2 gal./ft²).”

“NOTE: Part 13 Organic Products of the Safe Food for Canadians Regulations requires that the application for the organic certification of crops grown in greenhouses with a permanent in-ground soil system be filed at least 15 months before the day on which the food is expected to be sold. During that period of time, compliance with this standard will be assessed by the certification body and this assessment must include at least one inspection of the production unit, during production, in the year before crops may be eligible for certification and one inspection, during production, in the year crops are eligible for certification. This requirement does not apply to greenhouses built on land that is part of an existing organic operation. In

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7.5.2.4 The 60 L/m² (1.2 gal/ft²) soil volume must be maintained throughout the crop cycle.

c) Existing certified operations with soil volumes of less than the required 60 L/m² (1.2 gal/ft²) may continue as is. Soil volumes of 60 L/m² (1.2 gal/ft²) or more are required when existing production units expand their growing area or renovate their houses.

NOTE Operators of in-ground greenhouse operations that are new to organic certification can apply for certification as soon as they like, but to achieve full organic status:

-Initial applications to a certifier have to be submitted 15 months in advance of when the first organic product is anticipated of being marketed.

-Two site inspections are required before a certification body can assess compliance to the standard and grant organic status. One of these inspections must be done while the organic crop is in production.

For container crops, the situation is a bit different. Although soil used in a container cannot have been treated with a prohibited substance for at least 36 months, the protective structure (e.g., greenhouse) and the ground beneath it does not have to go through the 36-month transition period.

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CANADIAN ORGANIC STANDARDS*

the case of an initial application for organic certification of crops grown in containers, the application for certification must be filed within 12 months before the day on which the product is expected to be marketed.”

7.5.3 “Supplemental heat and carbon dioxide (CO₂) enrichment are permitted.

Supplemental nutrition with substances listed in Table 4.2 (Column 1) of CAN/CGSB-32.311 is permitted.”

7.5.4 “Sunlight shall be the primary source of light for photosynthesis in all crops covered by Clause 7.5. Supplemental lighting may be used. As an exception, annual seedling transplants started in winter or spring that will be planted in the operation may be started by the operation under 100% artificial lights, from seeding to first transplanting. The expression “first transplanting” means moving a seedling to another growing medium (in a box, pot, container or in the ground).”

COG'S GUIDE TO THE STANDARDS

After a certification body determines the operation meets the organic standard, organic products can be sold. This will involve at least one inspection and resolution of non-compliance issues identified by the certifier.

Existing organic operations can expand by simply informing their certifier; the certifier will determine their status and whether an additional inspection is required. Under these circumstances, no additional transition period will be imposed if no prohibited sub-stances have been used for the previous 36 months in the expansion area. The operator will need to provide the applicable production records as evidence.

7.5.3 Supplemental nutrition (fertilization) is limited to substances listed in Column 1 of Table 4.2 of the PSL. For in-ground structures, the intent is to encourage closed-loop systems using crop rotations and green manures, and using nutrients produced on one part of the farm (i.e., from livestock, green waste) as a nutritional supplement in another part (i.e., greenhouse production) as outlined in clause 5 for outdoor crop production. However, crop rotation is not required for crops covered by 7.5 (see 7.5.9).

Closed-loop systems can also be used in container operations. For example, recycling (recomposting) old mixes not only reduces waste but actually could lead to production benefits, for example, by inoculating the new growing media with healthy microorganisms.

7.5.4 As mentioned in 7.5.4, all lighting is permitted provided that it is supplemental to natural daylight except for certain transplants as described.

In the 2020 COS review, a proposal recommended allowing 100% artificial lighting. This could increase organic crop production in the Far North and in city buildings. In the winter, crop production in insulated buildings without windows using 100% artificial lighting is more energy efficient than winter greenhouse production that involves supplemental lighting and heating. These petitions generated heated discussions between members of the Greenhouse Working Group and the Technical Committee (TC) on Organic Agriculture.

After much debate, the TC agreed to permit 100% artificial lighting in the draft submitted for public comment, but only for crops harvested within 60 days of planting. This would

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CANADIAN ORGANIC STANDARDS*

COG'S GUIDE TO THE STANDARDS

7.5.5 “For crops harvested within 30 days of imbibition, organic seed shall be used.”

7.5.6 “Plants and soil, including potting soil, shall not come in contact with prohibited substances, including wood treated with prohibited substances.”

7.5.7 “For crop production, the operator shall:

- a) use reusable and recyclable pots and flats whenever possible;
- b) use substances listed in Table 4.2 (Column 1 or 2) of CAN/CGSB-32.311 as required;
- c) use appropriate equipment cleaners, disinfectants and sanitizers listed in Tables 7.3 and 7.4 of CAN/CGSB-32.311.”

allow artificial lighting to be used for crops that can grow in cool conditions, such as greens, but not for heat-loving crops, such as tomatoes, cucumbers and peppers. This proposal was submitted for public review by the CGSB and generated an unprecedented opposition. One petition alone had 11,000 signatures.

Opponents argued that sunlight is part of a living ecosystem and an essential part of the organic crop cycle. Plants grown in sunlight would have better flavour and more nutrients and antioxidants than crops grown under artificial light (however scientific studies show inconsistent results). And, opponents asked, would consumers accept organic food produced without sunlight?

In response to the intense public outcry, the TC reversed its decision and proposed that the only certified organic plants that could be grown under 100% artificial lighting would be:

Annual seedling transplants started in winter or spring that will be planted in the operation (as described in 5.3.3 and repeated in 7.5.4 of 32.310).

To learn more, see [OFC: The Question of Light](#).

7.5.5 Imbibition occurs when a seed swells after soaking up water.

7.5.6 Wood treated with prohibited materials (basically, all treated lumber except copper-treated lumber) may not come in contact with the plants or soil.

For existing situations, such as, purchasing a greenhouse built with treated lumber, the operator would need to lay an impervious layer between the treated lumber and the soil.

The use of treated lumber above growing plants would also not be allowed because condensed water could drip off of the treated wood and onto the plants.

7.5.7 a) This requirement is based on the organic principles of ecology and care (Clause II of 32.310). Operators should embrace this requirement and certifying bodies should encourage adherence to it.

c) Cleaning products used in greenhouse systems must comply with clause 7 of the PSL (32.311) be listed in Table 7.3 or 7.4. It might be helpful to read subclause 8.2 in 32.310.

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CANADIAN ORGANIC STANDARDS*

7.5.8 “The following procedures, processes or substances are permitted to:

a) clean and disinfect crop structures, equipment which may contact the soil or crop, and plant containers, pots and flats:

- 1) substances listed in Tables 7.3 or 7.4 of CAN/CGSB-32.311; and
- 2) steam-heat sterilization;

b) stimulate growth or development:

- 1) substances listed in Table 4.2 (Column 1 or 2) of CAN/CGSB-32.311; and
- 2) control of daily temperature and light levels;

c) prevent and control pests including diseases, insects and other organisms:

- 1) substances listed in Table 4.2 (Column 2) of CAN/CGSB-32.311;
- 2) pruning;
- 3) roguing;
- 4) vacuuming;
- 5) temperature manipulation, for example freezing, heating, steaming;
- 6) pest exclusion from greenhouses with air filters, screens or other physical devices; and
- 7) biological control methods.”

7.5.9 “Soil regeneration and recycling procedures shall be practiced. The following alternatives to crop rotation are permitted: grafting of plants onto disease-resistant rootstock; freezing the soil in winter; regeneration by incorporating biodegradable plant mulch (for example, straw or hay); and partial or complete replacement of greenhouse soil or container soil. Used soil shall be re-used either in the greenhouse, or on another crop, unless the disposal of used soil is mandatory due to a regulatory directive to avoid spreading pests (including insects or disease).”

COG'S GUIDE TO THE STANDARDS

7.5.8 This lists common practices in commercial greenhouse production that are acceptable in organic operations. It should not be assumed that the examples noted are the only methods available to produce the outcomes described in a, b, c, and d. Operators may find other methods that comply with organic principles and these standards. However, other methods might not be allowed. The certification body needs to evaluate these methods on a case-by-case basis and only substances on the specified PSL tables can be used.

At all times, operators should try to find the most energy-efficient solution.

7.5.8 c. This subclause is not a limited list. Other methods, such as trap crops, would be acceptable on a case-per-case basis if approved by the certifying body and if only substances in PSL Table 4.2 (Column 2) are used.

7.5.9 It is not enough to continually add inputs (especially soluble inputs) to maximize nutrition and production. Operators must actively put organic matter back into the soil to replace the organic matter mineralized through the years. To comply with this requirement, operators can add compost regularly and/or use green manure crops. Operators using containers are allowed to replace the soil in those containers. Ideally, the soil from the containers is re-used elsewhere on the farm (if applicable). The Standard allows certifying bodies some discretion regarding crop rotation, as this practice is occasionally not feasible in high-production, high-cost operations.

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CANADIAN ORGANIC STANDARDS*

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7.5.10 Greenhouse crop product preparation

“Wherever organic product preparation takes place, Clauses 8.1 and 8.2 apply.”

7.5.10 To maintain organic integrity during harvest and post-harvest, follow the requirements outlined in 8.1 and 8.2. Clause 9 becomes pertinent if further processing is done.

7.5.11 Facility pest management

“Clause 8.3 applies to pest management practices in and around crop facilities.”

7.5.11 When dealing with pests around the facility, for example rodents or silverfish, address the requirements in 8.3 of 32.310.

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